

0.5 percent halothane or 0.25 percent methoxyflurane. There has been some reluctance to use halogenated agents due to their known uterine relaxant properties and the resulting fear of increased blood loss. Findings in recent studies have shown that the addition of the previously mentioned concentrations does not affect blood loss during cesarean section. There is also concern that the potent agents may add to neonatal depression. Again, in the concentrations recommended for the few minutes before delivery there are data showing no greater incidence of fetal depression. As a matter of fact, there is an as yet unsubstantiated belief among some anesthesiologists that the fetus may actually be improved by the addition of a potent agent that decreases maternal catechol secretion and thereby improves uterine and placental blood flow. Maternal awareness certainly is decreased with the technique.

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Update on Mechanical Ventilation

THE RECENT INTRODUCTION of positive end-expiratory pressure (PEEP) and intermittent mandatory ventilation (IMV) of a spontaneously breathing patient, along with an increased understanding of the toxicity of unnecessarily high inspired concentrations of oxygen (FIO_2) have changed the clinical management of patients whose lungs are ventilated mechanically. The following describes current practice of mechanical ventilation, weaning and extubation.

As soon as the trachea of a critically ill patient is intubated, controlled mechanical ventilation is initiated with a tidal volume of 12 ml per kg of body weight, a respiratory rate of 10 to 12 breaths per minute and an FIO_2 of 1.0. PEEP is progressively added (range 0 to 20 mm of mercury) until the arterial partial pressure of oxygen (Pao_2) is 80 to 90 mm of mercury with an FIO_2 less than 0.5. Utilizing fiber-optic bronchoscopy, hourly turning of the patient, chest physical therapy, and frequent suctioning generally allows the physician to decrease PEEP to less than 10 mm of mercury with continued maintenance of an adequate Pao_2

with a low FIO_2 . When PEEP is less than 10 mm of mercury, IMV is begun initially at 10 breaths per minute. The rapidity by which the IMV can be reduced is dictated by and is directly proportional to the patient's vital capacity (VC) and maximum inspiratory force (MIF). As the IMV rate is decreased, the patient is monitored by VC, MIF, the spontaneous respiratory rate (SRR) and arterial partial pressure of carbon dioxide (Paco_2). When Pao_2 equals 80 mm of mercury FIO_2 is less than 0.5, PEEP is 5 mm of mercury, VC is greater than 10 ml per kg of body weight, MIF is greater than 20 mm of mercury, IMV is less than or equal to 1, SRR is less than 20 per minute and Paco_2 is approximately 40 mm of mercury, then the x-ray film of the chest is critically examined. If the x-ray findings are reasonably equivalent to the premonitory x-ray findings, or are rapidly improving and no new changes have appeared (such as infiltrates or pneumothorax), the patient's trachea then is extubated and oxygen is administered via nasal prongs or plastic mask.

The logic of this approach is that first the patient's lungs function as an efficient gas exchange organ (FIO_2 less than 0.5, adequate Pao_2); second that the patient can sustain this gas exchange (adequate VC, MIF, SRR, Paco_2 on a low IMF); and third that no new complicating factor has occurred (adequate findings on an x-ray study of the chest).

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Recent Developments in Pediatric Anesthesia

THE PRINCIPLES governing pediatric anesthesia are those employed in adult anesthesia with the addition of special emphasis on fluid balance and temperature control. An infant in whom surgical operation is being carried out requires the greatest attention in these areas.

Preparation of the infant for operation demands that the operating room become a large isolette. The room is prewarmed to 25.6°C (78°F), a warming blanket is placed on the operating room table (not in direct skin contact), an infrared radiant heater is available and, whenever possible, anesthetic gases are humidified and warmed